Amendments to the Claims:

Listing of the Claims:

1. (CURRENTLY AMENDED) An optical device comprising:

an optical path provided between an input port to which signal light modulated at a first frequency f_s is supplied and an output port; and

an optical loop optically coupled to said optical path;

said optical loop including:

an optical amplifier for compensating for a loss in said optical loop so that laser oscillation of a continuous wave having a wavelength λ_c occurs in said optical loop;

an adjuster for adjusting an optical path length of said optical loop so that said first frequency f_s becomes a second frequency f_s equal to an integral multiple of the reciprocal of a recirculation period of said optical loop;

an optical bandpass filter that allows light having said wavelength λ_c to pass; and

a nonlinear optical medium for mode-locking said laser oscillation according to said signal light,

wherein said nonlinear optical medium includes an optical fiber, and performs amplitude modulation of said continuous wave and said second frequency f_s to obtain light having said wavelength λ_c by four-wave mixing using said signal light as pump light, and

wherein ~~said amplitude modulation is independent of said frequency f_s~~ pulses including said wavelength λ_c and said second frequency f_s are generated by said nonlinear optical medium and output through the output port.

2. (CANCELED)

3. (PREVIOUSLY PRESENTED) An optical device according to claim 1, further comprising an optical coupler for optically coupling said optical path and said optical loop, said optical coupler providing a part of said optical path and a part of said optical loop.

4. (CANCELED)

5. (CANCELED)

6. (ORIGINAL) An optical device according to claim 1, wherein said nonlinear optical medium comprises a single-mode fiber.

7. (ORIGINAL) An optical device according to claim 1, wherein said nonlinear optical medium comprises a highly nonlinear dispersion shifted fiber.

8. (PREVIOUSLY PRESENTED) An optical device according to claim 6, wherein said nonlinear optical medium has a zero dispersion wavelength substantially equal to the wavelength of said signal light.

9. (ORIGINAL) An optical device according to claim 1, further comprising an input optical amplifier optically connected to said input port for amplifying said signal light.

10. (ORIGINAL) An optical device according to claim 9, further comprising an optical bandpass filter optically connected between said input port and said input optical amplifier and having a passband including a wavelength of said signal light.

11. (ORIGINAL) An optical device according to claim 1, further comprising an optical bandpass filter optically connected to said output port and having a passband including a wavelength of light obtained by said laser oscillation.

12. (ORIGINAL) An optical device according to claim 1, further comprising a waveform shaper optically connected to said output port for performing waveform shaping of said signal light according to an optical clock output from said output port.

13. (ORIGINAL) An optical device according to claim 12, wherein said waveform shaper comprises a nonlinear optical loop mirror.

14. (CURRENTLY AMENDED) A system comprising:

an optical fiber transmission line for transmitting signal light modulated at a <u>first</u> frequency f_s; and

an optical device connected to an output end of said optical fiber transmission line;

said optical device including:

an optical path provided between an input port to which said signal light is supplied and an output port;

an optical loop optically coupled to said optical path;

said optical loop including:

an optical amplifier for compensating for a loss in said optical loop so that laser oscillation of a continuous wave having a wavelength λ_c occurs in said optical loop;

an adjuster for adjusting the optical path length of said optical loop so that said first frequency f_s becomes a second frequency equal to an integral multiple of the reciprocal of a recirculation period of said optical loop;

an optical bandpass filter that allows light having said wavelength λ_c to pass; and

a nonlinear optical medium for mode-locking said laser oscillation according to said signal light,

wherein said nonlinear optical medium includes an optical fiber, and performs amplitude modulation of said continuous wave and said second frequency f_s to obtain light having said wavelength λ_c by four-wave mixing using said signal light as pump light, and

wherein ~~said amplitude modulation is independent of said frequency f_s~~ pulses including said wavelength λ_c and said second frequency f_s are generated by said nonlinear optical medium and output through the output port.

15. (CURRENTLY AMENDED) A system comprising:

an optical fiber transmission line for transmitting signal light; and

at least one optical repeater arranged along said optical fiber transmission line;

each of said at least one optical repeater including:

an optical clock regenerator for regenerating an optical clock by mode locking of laser oscillation according to said signal light; and

a waveform shaper for performing waveform shaping of said signal light according to said optical clock regenerated by said optical clock regenerator,

said optical clock regenerator including:

an optical path provided between an input port to which signal light modulated at a first frequency f_s is supplied and an output port; and

an optical loop optically coupled to said optical path;

said optical loop including:

an optical amplifier for compensating for a loss in said optical loop so that laser

oscillation of a continuous wave having a wavelength λ_c occurs in said optical loop:

an adjuster for adjusting an optical path length of said optical loop so that said first frequency f_s becomes a second frequency f_s equal to an integral multiple of the reciprocal of a recirculation period of said optical loop;

an optical bandpass filter that allows light having said wavelength λ_c to pass; and

a nonlinear optical medium for mode-locking said laser oscillation according to said signal light,

wherein said nonlinear optical medium includes an optical fiber, and performs amplitude modulation of said continuous wave and said second frequency to obtain light having said wavelength λ_c by four-wave mixing using said signal light as pump light, and

wherein ~~said amplitude modulation is independent of said frequency f_s~~ pulses including said wavelength λ_c and said second frequency f_s are generated by said nonlinear optical medium and output through the output port.

16. (ORIGINAL) A system according to claim 15, wherein said waveform shaper comprises a nonlinear optical loop mirror.

17. (CURRENTLY AMENDED) A method comprising the steps of:

(a) generating laser oscillation of a continuous wave having a wavelength λ_c in an optical loop including an optical fiber as a nonlinear optical medium;

(b) introducing a signal light modulated at a first frequency f_s into said optical loop;

(c) adjusting the optical path length of said optical loop so that said first frequency f_s becomes a second frequency f_s equal to an integral multiple of the reciprocal of a recirculation period of said optical loop;

(d) regenerating an optical clock by mode-locking said laser oscillation according to said signal light; and

(e) allowing light of said wavelength λ_c to pass;

wherein amplitude modulation of said continuous wave to obtain light having said wavelength λ_c is performed in said nonlinear optical medium by four-wave mixing using said signal light as pump light, and

wherein ~~said amplitude modulation is independent of said frequency f_s~~ pulses including said wavelength λ_c and said second frequency f_s are generated by said nonlinear optical medium and output through the output port.

18. (PREVIOUSLY PRESENTED) An optical device according to claim 7, wherein said nonlinear optical medium has a zero-dispersion wavelength substantially equal to the wavelength of said signal light.